Original Article

Exploring Anxiety Levels in Older Adults with a History of Falls: A Cross-Sectional Study in Banda Aceh

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ABSTRACT

OBJECTIVE: To explore anxiety levels among older adults in Banda Aceh with a history of falls.
METHODOLOGY: This cross-sectional study from August to September 2024 involved 100 older adults in Banda Aceh with a history of falls. Accidental sampling was used. The Geriatric Anxiety Scale (GAS) assessed anxiety levels, while the Short Physical Performance Battery (SPPB) and cognitive function were evaluated. Descriptive statistics summarized sociodemographic characteristics, health behaviors, fall history, medical history, fall risk, and anxiety levels.
RESULTS: The results showed that 47% of respondents said they had minimal experienced anxiety, 40% of respondents experienced mild anxiety, 7% of respondents had moderate levels of anxiety, and 6% of respondents experienced severe anxiety.
CONCLUSION: The study indicates varying levels of anxiety among older adults after falls, highlighting the significant contribution of falls to anxiety. Healthcare providers should implement anxiety screenings for older adults with a history of falls, as early intervention can enhance their quality of life.

KEYWORDS: History, accidental fall, anxiety, aged, Indonesia

INTRODUCTION

The mental health of older adults in Indonesia requires attention. Anxiety, a common issue, can significantly impact their quality of life if unmanaged. Excessive anxiety and stress may lead to negative life assessments, emotional changes, and mental confusion[1]. A study in Banda Aceh revealed that 43% of older adult respondents experienced minimal anxiety, 32% mild anxiety, 8% moderate anxiety, and 17% severe anxiety due to arthritis. The pain from arthritis often leads to acute anxiety about movement, resulting in decreased muscle and joint function over time[2].

There are several risk factors for anxiety in older adults, such as gender, lack of social support, adverse life events, limited functional abilities, chronic diseases, and lack of social participation[3,4]. In addition, anxiety is also a risk factor for falls in older adults. The results from a previous study found that someone who has a history of falls/severe falls has serious anxiety problems[5]. A prior investigation conducted in the emergency department revealed that 30.5% of geriatric patients exhibited significant anxiety following a fall, and 26% demonstrated symptoms indicative of Post-Traumatic Stress Disorder (PTSD) at a two-month follow-up[6].

A study in India reported a 37.5% prevalence of falls among older adults in the past year. Older adult women with moderate activity levels, anxiety, stress, and unemployment had a higher fall risk. Additionally, older adults with more significant functional disabilities were more prone to falls, with anxiety identified as the sole considerable risk factor[7]. In Thailand, approximately 12.11% of older adults experienced falls in the past year. Risk factors included having two or more chronic diseases, vision problems, and sleep disorders[8]. In Indonesia, the incidence of falls among older adults is 17%. The prevalence of fall injuries is 49.4% in those over 55 and 67.1% in those over 65. The incidence of falls increases annually, from 25% at age 70 to 35% after age 75[9]

Falling is one of the dominant problems that occurs in older adults. Falling is a sudden, unexpected, and unintentional event that causes the patient to be on the ground or at a lower level [10]. The known consequences of falling consist of functional limitations [11]. In addition, falling is an essential predictor of anxiety, and functional limitations and psychological discomfort will increase anxiety levels. Reduced mobility and independence can have a significant impact on older adults with mood disorders, and older adults are more likely to experience clinically significant anxiety [12].

Many studies have examined the relationship between loss of a spouse, chronic illness, and anxiety[14]. However, little attention has been paid to anxiety caused by falls in older adults, especially in Banda Aceh, Indonesia. The mental condition of older adults after a fall has not received much attention. In particular, only a few studies have thoroughly discussed the effects of falls on anxiety in older adults. Older adults who experience falls have anxiety symptoms that can lead to the avoidance of unnecessary activities, further decline in functional ability, and decline in their quality of life[13]. Therefore, it

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is essential to explore anxiety and falls among older adults in the community.

METHODOLOGY

Study Design

This study used a cross-sectional design, an observational study that analyzed data from a population at a particular time. It is used to measure the prevalence of health outcomes, understand the determinants of health, and describe the characteristics of a population[14]. This cross-sectional study was conducted in Banda Aceh from August to September 2024. The survey was conducted following the committee's guidelines. Before obtaining informed consent, the participants were informed of the study's nature, purpose, and potential benefits. Participants were also notified of the length of the interview, their right to withdraw from the study at any time without penalty, and the confidentiality of the survey information.

Population and Sample

This study's population was older adult people over 60 who had a history of falls in Banda Aceh. The population of the older adults were 15,820 people. We used the minimal accepted number of samples for a survey study, which is 100 [15]. The inclusion criteria for the samples were older adults with a history of falls. Accidental sampling was used to recruit the samples.

Instrument

This study used structured questionnaires that included sociodemographic characteristics, health behaviors, history of falls, risk of falls, medical history, and anxiety level. Sociodemographic characteristics included gender, age, religion, study, occupation, economic status, marital status, living arrangement, and primary caregiver. Health behaviors related to sports history, type of sport, and physical activity. The history of falls is associated with the history of falls from a year ago, the last fall, and the frequency of falls. Medical history included morbidity, duration of illness, medications consumed, and cognitive function. The instrument to detect anxiety in older adults is the Geriatric Anxiety Scale (GAS). This instrument uses a Likert scale; each question consists of 4 points, from 0 (never) to 3 (always). The categorization of anxiety is as follows: (a) not experiencing anxiety/minimal (value 0-18), (b) mild anxiety (value 19-37), (c) moderate anxiety (value 38-55), and (d) severe anxiety/panic (value 56-75). The validity test of the questionnaire used a correlation coefficient, and it was found that all items of this questionnaire had a positive relationship with each GAS subscale itself (somatic r = 0.86; cognitive r = 0.91; affective r = 0.92) with a p-value <0.1. In addition, each subscale also has a positive relationship with other subscales [16]. The GAS instrument has been translated back into Indonesian version [17]. Further, The Short Physical Performance Battery (SPPB) was used to detect the risk of falls in older adults. This instrument consists of three testing steps, namely 1) standing balance testing (tandem, semi-tandem, and side-by-side stands), 2) walking speed testing (8 feet or 4 meters with non-stop walking), and 3) testing the ability to get up from a chair (termed chair stand) [18]. The SPPB instrument has been translated back into Indonesian. The Indonesian version of the SPBB instrument has a reliability value (Cronbach α 0.80), which indicates that this instrument is reliable. In addition, this instrument also has good construct validity [19].

Data Collection

Face-to-face interviews assessed sociodemographic characteristics, health behaviors, fall history, and medical history. The SPPB and cognitive function assessments were administered through direct testing and self-reports to evaluate anxiety levels. Data collection occurred in various settings, including older adult polyclinics at primary health centres, Posbindu (integrated health service posts for older adults), religious study gatherings, and home visits.

Data Analysis

The collected data were handled using statistical analysis software. Descriptive statistics were used to assess all participants' sociodemographic characteristics, health behaviors, history of falls, medical history, risk of falls, and anxiety level. In particular, the categorical variables were described using frequencies and percentages.

RESULTS

Characteristics of Respondent

The results of the study showed that most of the respondents were female 69 respondents (69%), 73 respondents (73%) were older adults, 97 respondents (97%) were Muslim, 33 respondents (33%) were senior high school, 57 respondents (57%) were jobless, 30 respondents (30%) were deficient economic status, and the average respondent was a widow/widower 69 respondents (69%). Most of the respondents had a history of a single morbidity 59 respondents (59%), with a duration of illness >5 years 44 respondents (44%), and most of them were actively taking medication (79 respondents (79%). Respondents generally live with children, as many as 52 respondents (52%) and are cared for by their children by as many as 54 respondents (54%); the average older adult has a history of falling 1-5 years as many as 73 respondents (73%) with falling 1-5 times as many as 59 respondents (59%) and no exercise as many as 61 respondents (61%), and most of the respondents no physical activities as many as 52 respondents (52%). The results of the fall risk examination (SPBB) found that 25% of the respondents had scores of 3 and 4 for standing balance, 25% of the respondents had a walking speed with a score of 2, stand from a chair about 32% of the respondents were unable. The cognitive assessment results showed that most respondents had no mental disorders (61%). The analysis of anxiety levels based on respondent characteristics revealed that, although the majority of participants exhibited minimal levels of

anxiety, a notable proportion experienced moderate anxiety. This was particularly evident among respondents with specific demographic and clinical profiles: those with a junior high school education (17 respondents), unemployed individuals (24 respondents), those with low economic income (11 respondents), widows or widowers (29 respondents), individuals with a duration of illness ranging from 1 to 5 years (22 respondents), and those with a history of falling (25 respondents). Details can be seen in **Table I** below.

Table I: Characteristics of Respondents, Health History, History of Fall, Risk for Fall, Healthy Behavior, and Anxiety Level (n=100)

Demographic Data	Frequency (f)	Percentage (%)	Anxiety (f)			
			Minimum	Mild	Moderate	severe
Gender						
Male	31	31	14	10	3	4
Female	69	69	33	30	4	2
Age						
Older adult	73	73	34	28	6	5
Old Older adult	27	27	13	12	1	1
Religion						
Islam	97	97	45	39	7	6
Christianity	2	2	1	1	0	0
Buddhism	1	1	1	0	0	0
Study						
No school	3	3	1	0	1	1
Elementary School	16	16	8	5	2	1
Junior High School	16	16	6	10	0	0
Senior High School	33	33	11	17	4	1
Diploma	7	7	2	3	0	2
Bachelor	25	25	19	5	0	1
Occupation						
Jobless	57	57	28	24	3	2
Retired	27	27	14	8	4	1
Private Sector	7	7	3	4	0	0
Trader	1	1	0	1	0	0
Civil Servant	1	1	0	1	0	0
Farmer	2	2	0	2	0	0
Self-employed	5	5	2	0	0	3
Economic Status						
Very Low	30	30	7	14	7	2
Low	21	21	7	11	0	3
Intermediate	26	26	18	7	0	1
High	4	4	3	1	0	0
Very high	19	19	12	7	0	0
Marital status						
Married	31	31	19	11	0	1
Widow/Widower	69	69	28	29	7	5
Morbidity						
No Disease	6	6	4	2	0	0
Single	59	59	26	23	7	3
Multiple	35	35	17	15	0	3
Duration of Illness						
No	5	5	4	1	0	0
<1 year	14	14	8	3	0	3
1-5 years	37	37	10	22	3	2
>5 years	44	44	25	14	4	1
Medication						
Yes	79	79	32	35	7	5
No	21	21	15	5	0	1
Living Arrangement						
Spouse	33	33	19	12	0	2
Children	52	52	25	21	4	2
Alone	7	7	1	3	1	2
Family	5	5	2	3	0	0
Grandchild	3	3	0	1	2	0
Main Caregiver						
Children	54	54	25	23	4	2
Husband/Wife	31	31	19	10	0	2
Family	6	6	2	3	1	0
Grandchild	3	3	0	1	2	0
Others	1	1	0	1	0	0
No caregiver	5	5	1	2	0	2
History of falls a year ago						
Yes	50	50	17	25	4	4
No	50	50	30	15	3	2
Last fall						
<1 Year	20	20	5	8	4	3
1-5 Years	73	73	39	28	3	3
>5 Years	7	7	3	4	0	0
Frequency of fall						
Forgot	41	41	17	20	0	4
1-5 Times	59	59	30	20	7	2
Sports						
Yes	40	40	27	13	0	0
No	60	60	20	27	7	6
Types of Sport						
No	60	60	20	27	7	6
Leisurely walk	12	12	9	3	0	0
Jogging	3	3	2	1	0	0
Calisthenics	23	23	15	8	0	0
Football	1	1	0	1	0	0
Bicycle	1	1	1	0	0	0
Physical Activity						
Yes	48	48	28	18	0	2
No	52	52	19	22	7	4
SPPB						
Standing Balance						
0	19	19	8	10	0	1
1	16	16	4	8	4	0
2	15	15	3	6	2	4
3	25	25	10	13	1	1
4	25	25	22	3	0	0
Walking Speed Test						
0	22	22	7	12	0	3
1	17	17	2	9	4	2
2	25	25	13	10	2	0
3	18	18	10	7	1	0
4	18	18	15	2	0	1
Stand from the Chair						
0	32	32	13	17	1	1
1	16	16	5	5	5	1
2	25	25	9	13	0	3
3	9	9	6	2	1	0
4	18	18	14	3	0	1
Cognitive Function						
No Cognitive decline	61	61	31	20	7	3
Cognitive function problem	39	39	16	20	0	3

The results of the anxiety level examination obtained a total of respondents with a minimum anxiety level of 47 respondents (47%), mild 40 respondents (40%), moderate 7 respondents (7%), and severe 6

respondents (6%). The results of the anxiety examination showed that somatic changes were in a minimum condition of 47 respondents (47%), cognitive changes at a minimum level of 57 respondents (57%), and experienced affective changes at a minimum level of 58 respondents (58%), this can be briefly seen in **Table II** below.

Table II: Frequency Distribution of Geriatric Anxiety Total and Subscales

Anxiety	Frequency (f)	Percentage (%)
Total Anxiety		
Minimal	47	47
Mild	40	40
Moderate	7	7
Severe	6	6
Somatic		
Minimal	47	47
Mild	31	31
Moderate	13	13
Severe	9	9
Cognitive		
Minimal	57	57
Mild	35	35
Moderate	2	2
Severe	6	6
Affective		
Minimal	58	58
Mild	33	33
Moderate	4	4
Severe	5	5

DISCUSSION

This cross-sectional study aimed to assess anxiety levels among older adults with a history of falls. The findings revealed that 47 respondents (47%) reported experiencing minimal anxiety. While the majority of older adults reported minimal anxiety, this does not imply the absence of anxiety; instead, they experience it at a lower intensity following a fall. However, 6% of respondents reported severe anxiety, indicating that falling can significantly impact anxiety levels in older adults. Similarly, a previous study conducted in Banda Aceh found that 43.0% of respondents said they had minimal experience anxiety as a result of their arthritis. The pain caused by arthritis often makes sufferers acute and anxious about moving; if this happens continuously, it can decrease muscle and joint function[2]. A previous study conducted in the emergency department also found that 30.5% of older adult patients showed significant levels of anxiety after their fall, and 26% showed evidence supporting the presence of Post Traumatic Stress Disorder (PTSD) at 2 months[6].

Older adult physical factors and psychological conditions affect the incidence of falls in older adults higher, affecting the decline in physical function[20]. This study shows that the average older adult has a history of falling 1-5 years, 73% with a frequency of falling 1-5 times as much as 59%, which 7 older adults had moderate anxiety levels. This finding is supported by a previous study, which showed that anxiety symptoms and fall risk ratios can predict the level of anxiety about falling and future activity restrictions independently compared to older adults who do not have anxiety symptoms[21]. Anxiety and physical weakness are common problems in older adults. Anxiety in older adults with a history of previous falls causes physical restrictions in carrying out daily activities, which ultimately leads to a decrease in long-term physical abilities such as decreased muscle strength, balance deficits and physical mobility[22]. Anxiety symptoms can also increase the risk of falling in the future[21]. The previous study also found that anxiety is associated with an increased risk of falls[23], and falls are significantly associated with a higher risk of anxiety and depression in older adults in China[5]. The previous study also found that physical function and psychological conditions are two influential factors in falls, so the incidence of falls in older adults is higher[20]. Psychological factors play a significant role in predicting the risk of falls in older adults[24]. This study also indicates that unproductive older adults, those with low economic status, a history of comorbidities, and those on medication tend to experience mild anxiety. Additionally, previous research has found that declining physical function and prolonged illness[25], as well as inadequate management of chronic diseases, can directly influence older adults' perception of their health[24].

The risk of falling in older adults has a high potential. This study found that older adults who cannot stand balance, cannot walk, and cannot stand from a chair had a mild anxiety level compared with older adults who can balance in standing well, good walking speed and good standing on the chair, which had minimum anxiety level. This happens because older adults tend to prioritize movements to balance body posture while walking (internal factors) rather than focusing on the path passed or obstacles (external factors), alertness to external threats while walking is a response that is mostly unconscious behavior in the older adult[26], such as walking in a challenging environment (uneven or irregular surfaces)[27]. Anxiety about falling indirectly affects the ability to maintain balance and behave during activities, so there is the potential for falling[28].

Other consistent studies explain that exercise can improve balance and prevent the risk of falls in older adults[29]. Lower limb muscle function in older adults significantly contributes to the incidence of falls[25]. This is in line with what was found in the current study, which showed that the older adult who do not have much physical activity or exercise allows the anxiety experienced, especially older adult who has a history of falls. This is also reflected in older adults who feel conditions all the time, feeling tense muscles and experiencing back pain, neck pain and muscle cramps. Experiencing decreased activity affects balance and gait function. Increasing physical activity and psychological health significantly prevents

weakness syndrome and disease emergence in the older adult[30]. The study highlights the significant link between a history of falls and increased anxiety levels among older adults. This underscores the importance of recognizing that physical health issues, such as falls, are closely intertwined with mental health. By understanding this relationship, healthcare providers can better address the holistic needs of older adult patients. Further, routine screenings for anxiety in this population are essential. Integrating mental health assessments into fall prevention programs could help identify individuals at risk and provide them with appropriate support.

CONCLUSION

In conclusion, the findings of this study underscore the importance of recognizing anxiety as a significant concern among older adults with a history of falls. By addressing the physical and psychological dimensions of fall prevention, healthcare providers can enhance the quality of life for older adults in Banda Aceh and beyond. Further research is needed to explore the underlying mechanisms linking falls and anxiety. Additionally, studies should evaluate the effectiveness of intervention programs aimed at reducing anxiety among older adults with a history of falls. Mixed-method approaches could also provide a more comprehensive understanding of the lived experiences of these individuals.

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Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

AUTHOR CONTRIBUTION

Juanita: Responsible for supervising the article's composition, examining pertinent concepts, gathering data, and formulating the research.
Marzoeki DYA: Tasked with locating relevant articles about the manuscript and collecting data.
Rahmawati: Accountable for preparing the discussion section of the document.
Febriana D: Tasked with editing the paper, overseeing the writing process, performing data analysis, and taking the corresponding author role.

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